



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/625,200 07/21/00 STEINHARDT

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PEPPER HAMILTON
500 FOURTEENTH STREET NW
WASHINGTON DC 20005

EXAMINER

HASSANZADEH, P	
ART UNIT	PAPER NUMBER

1763
DATE MAILED:

11/07/01

Handwritten number 7

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/625,200

Applicant(s)

STEINHARDT ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: _____

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on 10/16/98. It is noted, however, that applicant has not filed a certified copy of the German application as required by 35 U.S.C. 119(b).

Specification

The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(1). A new abstract of the disclosure is required and *must be presented on a separate sheet, apart from any other text.*

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 2, the word "conductor" in "a coaxial conductor" is vague and may read on an electrical, heat, or gas conductor, thus for further clarity it should be changed to "an *electrically* coaxial conductor".

In claim 5, line 3, the term "in particular" is vague because it is not clear whether the cooling means is limited to water cooling or water cooling is merely a preferred means of cooling.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Selwyn (US Patent No. 5,961,772).

Selwyn teaches an atmospheric plasma jet apparatus (Fig. 1) comprising: a capacitively coupled RF source 12 (*a generator to generate an electromagnetic wave*); a central rod-shaped electrode 14 and a cylindrical electrically conducting chamber 20 (*a coaxial conductor in which the electromagnetic wave is guided*); an annular region 18 through which plasma gases are passes (*at least one plasma zone in which the excited and/or ionized particles are formed by the electromagnetic wave*) wherein the plasma gases are introduced into the annular region 18 (*an interior chamber of the coaxial conductor between an outer conductor and an inner conductor and that the inner chamber forms the plasma zone*) via an inlet connected to a gas source 16 (column 5, lines 10-31 and column 7, lines 43-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn (US Patent No. 5,961,772).

Selwyn teaches all the limitations of the claims except for explicitly describe the material composition of the electrically conductive chamber and the central electrode (coaxial conductor). The selection of material composition among the commonly used electrically conductor as metal is considered to have been obvious to one of ordinary skill in the art at the time of the invention and thus, it dose not add any new structural element to the apparatus.

Regarding claims 5-10 (cooling the inner/outer conductor, impedance converter, hollow waveguide, length of the plasma zone being variable, a sensor to monitor the plasma): the above cited claims differ from the prior art by specifying various well known features in the plasma art.

It is the Examiner's position that a person having ordinary skill in the art at the time of the invention would have found it obvious to modify the apparatus as taught by Selwyn by applying the *well known features* as desired for the intended usage.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn (US Patent No. 5,961,772) in view of Sakudo et al (US Patent No. 4,543,465).

Selwyn teaches all the limitations of the claims except for a magnetic system provided outside of the outer conductor.

Sakudo et al teach a high-frequency discharge apparatus (Fig. 1) including a magnetic field generating system including a magnetic field generating coil 7 and a constant current source 11 in order to generate a magnetic field in a discharge space 6, the magnetic field will affect the plasma density characteristic particularly for ion extraction (column 2, lines 23-49 and claim 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the magnetic field generating system as taught by Sakudo et al in the apparatus of Selwyn in order to generate a magnetic field in the plasma region which will affect the plasma density characteristic particularly for ion extraction.

Regarding claims 13-14 (variation of magnetic generating system): the further addition of magnetic rings and rod at the outer and inner conductors are also considered obvious modification and within the general knowledge of one of ordinary skill in the art at the time of the invention.

Allowable Subject Matter

Claim 2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: a plasma reactor comprising: a *magnetron* power generator connected to an *electrically coaxial conductor*, wherein the coaxial conductor includes an *inlet for introducing a process gas* into an *interior chamber* defined between an outer conductor and an inner conductor of the coaxial conductor and wherein a *plasma is formed in the interior chamber*.

Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office Action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Henaff et al (US Patent No. 4,434,742) teach a plasma discharge system including a high-frequency power source and a coaxial conductor (12, 14) wherein the outer conductor 12 is connected to process gas inlet 28; Knowles et al (US Patent No. 5,560,779) and Kurihara et al (US Patent No. 5,368,897) disclose a discharge plasma system including an inner and an outer electrode therebetween a

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process gas is introduced and converted into a plasma; and Cheung et al (US Patent No. 6,187,072 B1) disclose a microwave plasma system (Fig. 26) including two electrodes 286, 288 disposed inside a plasma tube 250 connected to a waveguide 262.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-5408 for regular communications and (703)305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Parviz Hassanzadeh
Examiner
Art Unit 1763

p. h.
November 2, 2001


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700